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(54) Title: PRINTOUT FOR TELEVISION DISPLAY (57) Abstract <p>A viewer can print a particular image displayed on a video by pressing a print button on a control which causes a processor to actuate a video import device and to freeze and store the desired image. The computer then actuates a printer that prints the image.</p>		

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Title

PRINTOUT FOR TELEVISION DISPLAY

Field of the Invention

5 This invention relates to television displays, and particularly to methods and means for printing an image of instantaneous televisions displays.

Background of the Invention

10 Television advertisers usually conclude their promotions by flashing their purchase requirements such, as telephone numbers and/or addresses on screen. Often the perspective customer has insufficient time to obtain a writing instrument and paper to copy the information. Also, the advertiser, or other television
15 producer, has no way of conveying printed information, such as a coupon, to the viewer.

An object of the invention is to improve methods and means for conveying information to viewers.

Summary of the Invention

20 According to a feature of the invention, the object is obtained by capturing one or more television images with a video import device in response to a viewer signal, and printing the captured image.

This and other features of the invention are

pointed out in the claims. Other objects and advantages of the invention will become evident from the following detailed description when read in light of the accompanying drawings.

5

Brief Description of the Drawings

Fig. 1 is a block diagram of a system embodying features of the invention.

Fig. 2 is a block diagram of yet another embodiment of the invention.

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Fig. 3 is a block diagram of yet another embodiment of the invention.

Fig. 4 is a flow chart illustrating operation of an embodiment of the invention.

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Fig. 5 is another flow chart illustrating operation of an embodiment of the invention.

Fig. 6 is another flow chart illustrating operation of an embodiment of the invention.

Fig. 7 is another flow chart illustrating operation of an embodiment of the invention.

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Fig. 8 illustrates another embodiment of the invention.

Fig. 9 illustrates operation of the system of Fig. 8.

Fig. 10 illustrates another embodiment of the invention where the processing occurs on site.

Fig. 11 illustrates another embodiment of the invention where signals arrive into a television set by wireless communication.

Fig. 12 illustrate the operation of Fig. 10

Fig. 13 illustrates yet another embodiment of the invention.

Detailed Description of Preferred Embodiments

Fig. 1 illustrates a system embodying the invention. Here, a video cassette recorder VCR1 receives or transmits video and audio signals to or from a television set TS1 in the usual manner. A standard computer CP1 contains a processor PR1, memory MEM1 in the form of hard drive and floppy drives and random access memory (RAM), a keyboard KEY1, etc. The computer CP1 also contains a video import VI1 in the form of a printed circuit computer card of the type available from Creative Labs, Inc. as Video Blaster SE 200. The import VI1 can import and export video images and still frames. A remote control RC1 communicates electromagnetically, such as by infra red light, in the usual manner with a sensor on the television set TS1 to change channels.

In response to signals from the processor PR1 and initiated from the keyboard, the import VI1 captures one or more still video images from the

television set TS1 and stores them in the memory MEM1. A viewer presses the keys of the keyboard KEY1 to control the time during which the video import VI1 captures images. The keyboard KEY1 also controls the processor PR1 to cause printer PRN1, connected to the processor PR1, to print the images memorized in the memory MEM1 of the computer.

In operation, a viewer watches the television set TS of Fig. 1. When an image which the viewer wishes to preserve in print appears, the viewer presses the appropriate key or keys on the keyboard KEY1 as set forth in the instructions of the video import VI1 to start capturing images. The viewer then presses the other keys set forth in the instructions of the video import VI1 to stop storing images. Alternatively the timing for the end of the capture is set by the keyboard, or the video import, or the processor at the start of capture. The timing may also be a preset default set in the processor PR1 or the video import, or it may be set by the user. At the end of the image capture, the processor PR1 starts the computer's print program. This initiates printing by the printer PRN1. The images that the viewer wishes to print may for example be one with a telephone number in an advertisement, an address, or a coupon that an advertiser wishes to distribute to viewers. It may also be in the form of a newsletter.

According to an embodiment of the invention, the computer CP1 counts the number of frames and then signals the video import VI1 to end the capture and storage of images after a predetermined number of image

frames. In present import devices, one minute of video requires 6 Megabytes of memory in the memory MEM1. In one second, the video import V11 captures approximately 20 frames, a sufficient amount for printing. One
5 second of capture may require 1 to 2 Kilobytes of memory. Thus the amount of memory necessary for printing is small enough for RAM.

Fig. 2 illustrates another embodiment of the invention. Here the remote control RC1 also
10 communicates electromagnetically, such as by infra red light, in the usual manner with a sensor SE1 on the television set TS1 to change channels. The remote control RC1 here forms a second signal in response to a push button PB1 for actuating a second sensor SE2 that
15 controls actuation of operation in the processor PR1 which starts image capture by the video import V11. According to one embodiment of the invention, a second press of the push button PB1 sends a second signal to the sensor SE2 to end image capture. According to yet
20 another embodiment of the invention, a program in the processor automatically ends image capture image capture after a predetermined time, such as one second, after the initial press of the bush button PB1.

In operation, a viewer, while watching a
25 television presentation, selects a particular image the viewer wishes to print in the set TS1 of Fig.2. An example of such a image would be an advertisement showing a telephone number to call. Another example is an address to which the viewer is to write to obtain
30 information. When the viewer presses the print button PB1 on the remote control RC1, the latter sends a

signal electromagnetically, such as by infra red light, which the sensor SE2 receives. The processor PR1 then initiates operation of the video import VI1 which starts capture of the images on the television set.

5 The processor PR1 receives the captured images and stores them in the memory MEM1. The processor then commands the printer PRN1 to print the image. The viewer then can utilize the image without having to write the information on a separate piece of paper.

10 According to one of the two latter embodiments of the invention, the viewer presses the push button PB1 a second time. This causes the remote control RC1 to send a second signal to the sensor SE2 to end image capture. According to the other of the

15 two latter embodiments of the invention, a program in the processor PR1 automatically ends image capture after a predetermined time, such as one second, after the initial press of the bush button PB1.

Fig.3 illustrates another embodiment of the invention. Here, the television set TS1 includes a

20 screen SC1, a video import circuit VIC1, a microprocessor MP1 with RAM, and the sensors SE1 and SE2. The video circuit VC1 performs in the customary manner in the television set TS1. The video import circuit VIC1 connects to the video circuit VC1 and operates in the same manner as the video input VI1.

25 The microprocessor MP1 includes a RAM sufficiently large to store images as required. The microprocessor MP1 responds to the sensor SE2 receiving a signal from the remote control RC1 and causes the video import

30 circuit VIC1 to capture images from the video circuit

VC1, and then stores the captured images in its RAM. Then, either according to one embodiment, in response to a second signal from the remote control RC1 to the sensor SE2, or according to another embodiment, in response to a setting in the microprocessor MP1, the microprocessor MP1 actuates the printer PRN1. The latter then prints the image.

In operation, the viewer, while watching a television presentation, selects a particular image the viewer wishes to print in Fig. 3. When the viewer presses the print button PB1 on the remote control RC1, the latter sends a signal electromagnetically, such as by infra red light, which the sensor SE2 receives. The microprocessor MP1 then initiates operation of the video import circuit VIC1 which starts capture of the images on the television set. The microprocessor MP1 receives the captured images and stores them in its RAM memory. The microprocessor MP1 then commands the printer PRN1 to print the image. The viewer then can utilize the image without having to write the information on a separate piece of paper.

According to one embodiment of the invention, the viewer presses the push button PB1 a second time. This causes the remote control RC1 to send a second signal to the sensor SE2 to end image capture. According to another embodiment of the invention, a program in the microprocessor PR1 automatically ends image capture after a predetermined time, such as one second, after the initial press of the push button PB1.

Fig.4 is a flow chart illustrating another

embodiment of the operation of Fig.1. Here, when an image which the viewer wishes to preserve appears, the viewer presses the appropriate key or keys on the keyboard KEY1 as shown in step 404. In step 407, the processor PR1 responds by asking whether automatic timing (auto timing) arrangement has been set. If yes, the processor PR1 accesses the auto timing in step 410. In step 414, it signals the video import V11 to start. In step 417 the video import begins to capture images. In step 420, the processor ask periodically whether timing in set in step 407 is complete. If no, it instructs the video import V11 to continue capturing images by going back to step 417. If yes, the processor tells the video import to end image capture in step 424.

If the answer to step 407 is no, the viewer sets the time with a key in step 430 and signals the video import to start in step 434. In step 437, the video import begins to capturing images and ends the capture in step 424. At the end of the capture, the processor PR1 signals the printer PRN1 in 440 and starts the printer in step 444.

Fig.5 is a flow chart illustrating another embodiment of the system in Fig.2. Here, when a viewer wishes to print an image in a screen, he presses the print button on the control RC1 in step 504. In step 507, a sensor SE2 senses the start signal, and the processor PR1, in step 510 asks whether automatic timing exists or has been selected. If yes, in step 517, the processor accesses the automatic timing and instructs the video import V11 to capture images in

step 520. In step 524, the processor asks whether timing has been complete as set in step 517. If no, the processor returns to step 520 and instructs the video import to continue capturing images. If yes, the processor proceeds to 527 and ends the capture.

If the answer to step 514 is no, processor PR1 signals the video import to start in step 534. In step 537, the video import VI1 captures images. The capture of images continues until the viewer sends an end signal in step 540. It then proceeds to step 527 to end the capture. In step 544, the processor PR1 signals the printer PRN1 to start printing which occurs in step 548.

Fig.6 is a flow chart illustrating another embodiment of the intention with respect to the system in Fig.3. Here, the viewer, while watching the television presentation, selects a particular image the viewer wishes to print by pressing the print button in step 604. In step 607 the microprocessor MP1 then asks whether an automatic timing arrangement exists or has been set. If the answer is yes, the microprocessor MP1 accesses the auto timing in step 614, and in step 617, the video import VI1 starts capturing images. At regular intervals, the microprocessor MP1 asks whether the timing set in 610 has completed. If no, it instructs the video import to continue capturing images as in step 617. If yes, the microprocessor MP1 goes to step 624 to end the capture.

If the answer to step 610 is no, the microprocessor MP1 signals the video import to start in

step 630. In step 634, the video import captures images. In step 637 the viewer sends an end signal to the sensor SE2 and the microprocessor MP1 proceeds to step 624 to end the capture. The microprocessor MP1
5 then signals the printer in step 614, and in step 644 the printer PRN1 begins to print.

Fig.7 is a flow diagram illustrating another embodiment of the operation of the system in Fig.3. Here, step 704 to step 744 correspond to respective
10 step 604 and 644. However, step 710 differs from step 610 in that the microprocessor MP1 asks whether a frame count in the television presentation has been set or exists. If yes, it proceeds to step 714 which differs from 614 in starting to count frames. Step 720 differs
15 from step 620 in asking, after each frame, whether the frame counts set in steps 710 and 714 is complete. If not, it returns to step 717. If yes, it proceeds to step 724.

According to an embodiment of the invention,
20 for operation with steps 4, 5, and 6 the processor PR1, PR2, and the microprocessor MP1 each include an automatic timer of hardware or software type which may be set by the user or is set by a default condition. The timer times the image capture.

25 According to another embodiment of the invention, the microprocessor MP1 of Fig.3 includes a framer counter for operation with the steps of Fig.7. The frame counter counts the frames being captured by the video import. According to another, each of the
30 timers in Figs. 1, 2, and 3 is replaced by a frame

counter and operates in accordance with Fig.7. In that case, the step of pressing the print button in Figs.1 and 2 is replaced with operation of the keyboard KEY1.

5 The system according to the invention permits a television programmer to issue coupons to viewers. To accomplish this end, the advertizer displays the coupon on the television and the viewer, if the viewer wishes such a coupon, presses the button PB1 and initiates the steps which cause the printer PRN1 to
10 print an image of the coupon. The viewer can then use the coupon as necessary.

 The system according to the invention also permits the television programmer to transmit newsletters and other printed information to the viewer
15 for the viewer's later review. Again, the programmer displays the image of the written document on the screen and the viewer, by pressing the button PB1 initiates the steps that cause the printer PRN1 to print out the document.

20 Fig. 8 illustrates another embodiment of the invention. Here, the printing process is provided by a telephone company. Both a TV set TS8 and a telephone set TE8 connect to an incoming cable CB8 from the telephone company. A printer set PS8 connects to the
25 TV set. According to another embodiment the printer set PS8 is part of the television set TS8.

 While watching, if a viewer sees a telephone number or text on the screen which the viewer wishes to record, the viewer pushes a number and a star key into

the telephone set during the display. According to an embodiment the printer PS8 connects to a port on the back of the TV set TS8 which includes chips. According to yet another embodiment of the invention, the printer set is built into the TV, and yet another embodiment the connection from the printer set PS8 is through an adapter box.

The number which the viewer dials on the telephone set TE8 is, for example, a special number assigned to identify the channel and identify the viewer.

Fig. 9 illustrates operation of the system of Fig. 8. Here, in step 904, signals are received and collected by the television set through the incoming cable CB8. In step 907 the television displays the received image. When a viewer wishes to obtain a printout of text from the image, the viewer dials the telephone as shown in step 910. In step 914, the cable company any issues a signal. The signal passes to the television set TS8 as shown in step 917. In step 920 the processor within the television set converts the signals from analog to digital form, and in step 924 separates the text. In step 927 the processor prints the text.

In another embodiment of the invention, the processing occurs on site. This is shown in Fig. 10. Here, signals from a cable company pass to a cable box CB101 and then to a processor PR101. From the processor the signals pass both to the TV set TS101 as well as to a printer PRN101. A remote control RC101

controls both the cable box CB101 and the processor PR101.

5 Fig. 11 illustrates another embodiment of the invention where signals arrive into a television set by wireless communication. Here, an antenna AN111 connects to a tuner of a processor PR111. The processor includes a video receiver which passes signals to a TV set TS111. The processor also has a processing section which passes outputting signals to a printer PRN111. A remote control RC111 in remote
10 contact with the processor PR111 tunes the tuner section of the processor PR111 and contains a key code signalling the processor to print images or the text portion of images with a printer PRN111.

15 Fig. 12 illustrate the operation of Fig. 10 where processing is performed by the cable company. Here, in step 1204 an image is collected and step 1207 an image is received. When a viewer wishes to print the image or the text portion thereof, the viewer dials
20 a telephone or a push button on a remote control as shown in step 1210. The signal to the cable company in step 1214 indicates what channel is being watched, what product is involved, and any additional information from their memory. The cable company, in step 1217
25 sends the data back and step 1220 also saves the section being watched in the memory box of the customer. In step 1224, the viewer receives a signal from the cable company and the processor PR101, in step 1230, converts the signals from analog to digital form. In step 1234 the processor PR101 separates the text
30 from the image in step 1237 the printer PRN101 prints

the desired information.

Fig. 13 illustrates yet another embodiment of the invention. Here, an antenna AN131 passes television pictures to a TV set TS131. Within the TV set TS131 chips freeze the picture when necessary. A processor PR131 processes the frozen picture to separate text if necessary, and a printer PRN131 prints the desired information. The freezing of the picture is initiated when a viewer operates a remote control RC131 and initiates freezing of the picture, operation of the processor PR131 and the printer PRN131.

While the embodiments of the invention have been described in detail, it will be evident that the invention may be embodied otherwise without departing from its spirit and scope.

15

What is claimed is:

1. A television print system, comprising:
a video import device connected to an imaging
arrangement;

5 computer means having a memory and connected
to said import device for actuating the import device
and storing the imported video image;

a printer connected to said computer means
for printing the image; and

10 an image selector coupled to said video
import device and responsive to a signal from a viewer.

2. A system as in claim 1, wherein the
computer is a microprocessor and said import device and
said computer form a single television set.

15 3. A system as in claim 1, wherein said
image selector is a remote control coupled to said
computer.

4. A system as in claim 1, wherein said
image selector is a remote control coupled to said
20 computer by infra-red light.

5. A system as in claim 2, wherein said
image selector is a remote control coupled to said
computer by infra-red light.

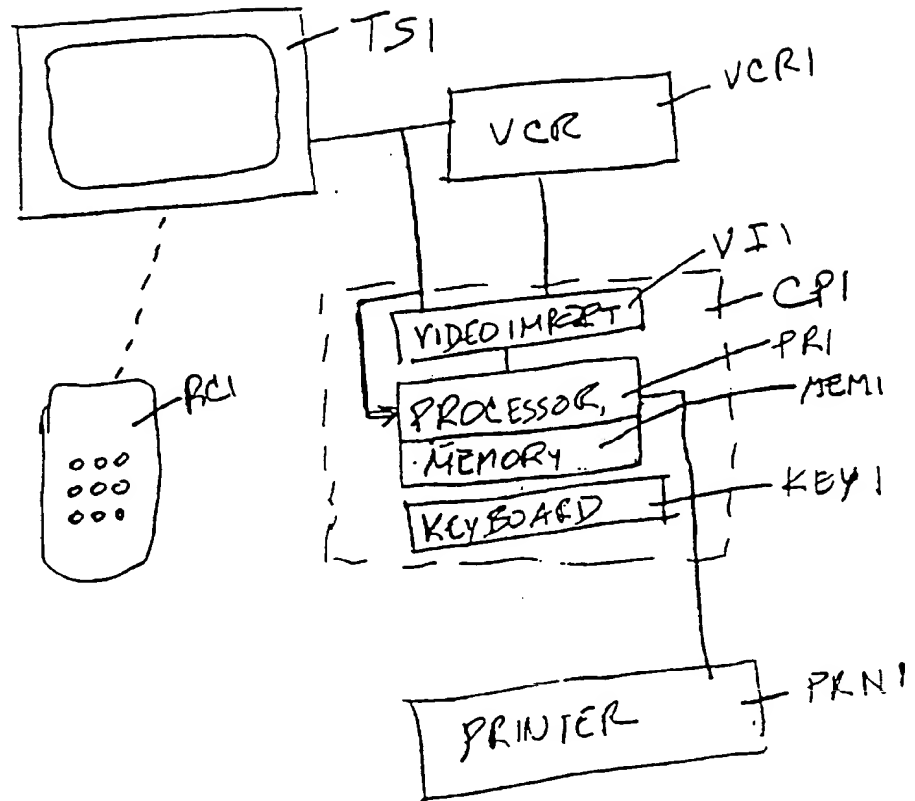


Fig. 1

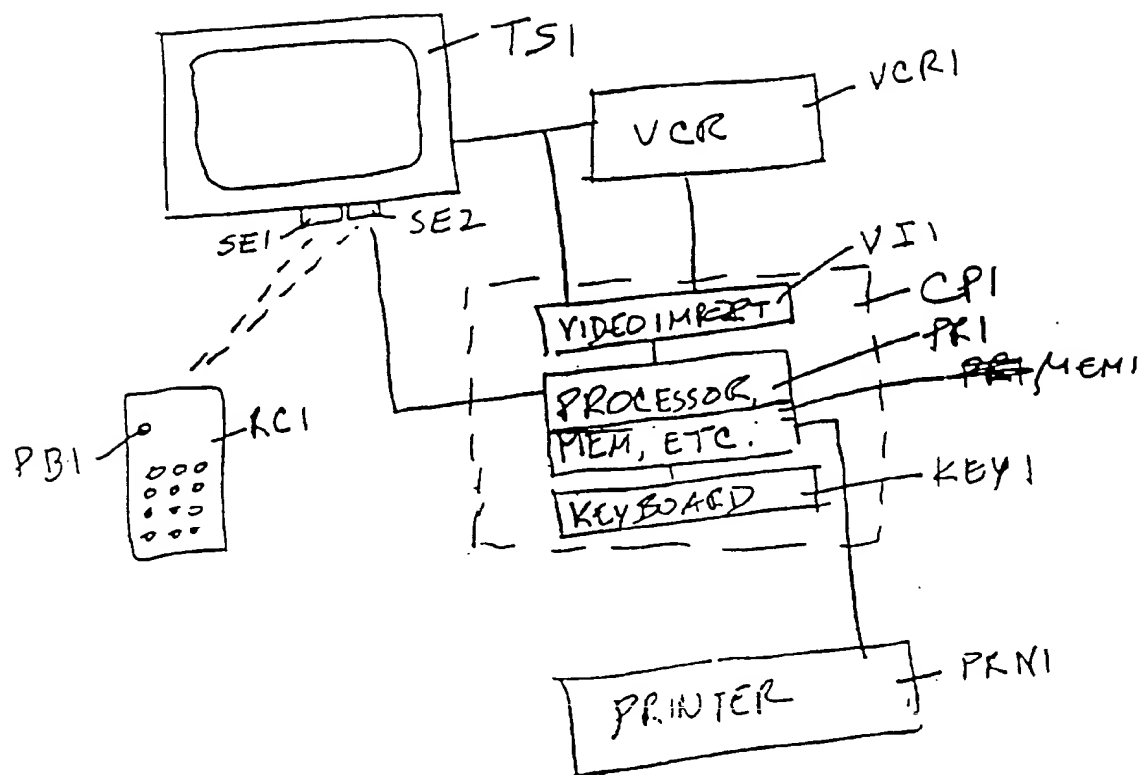


Fig. 2

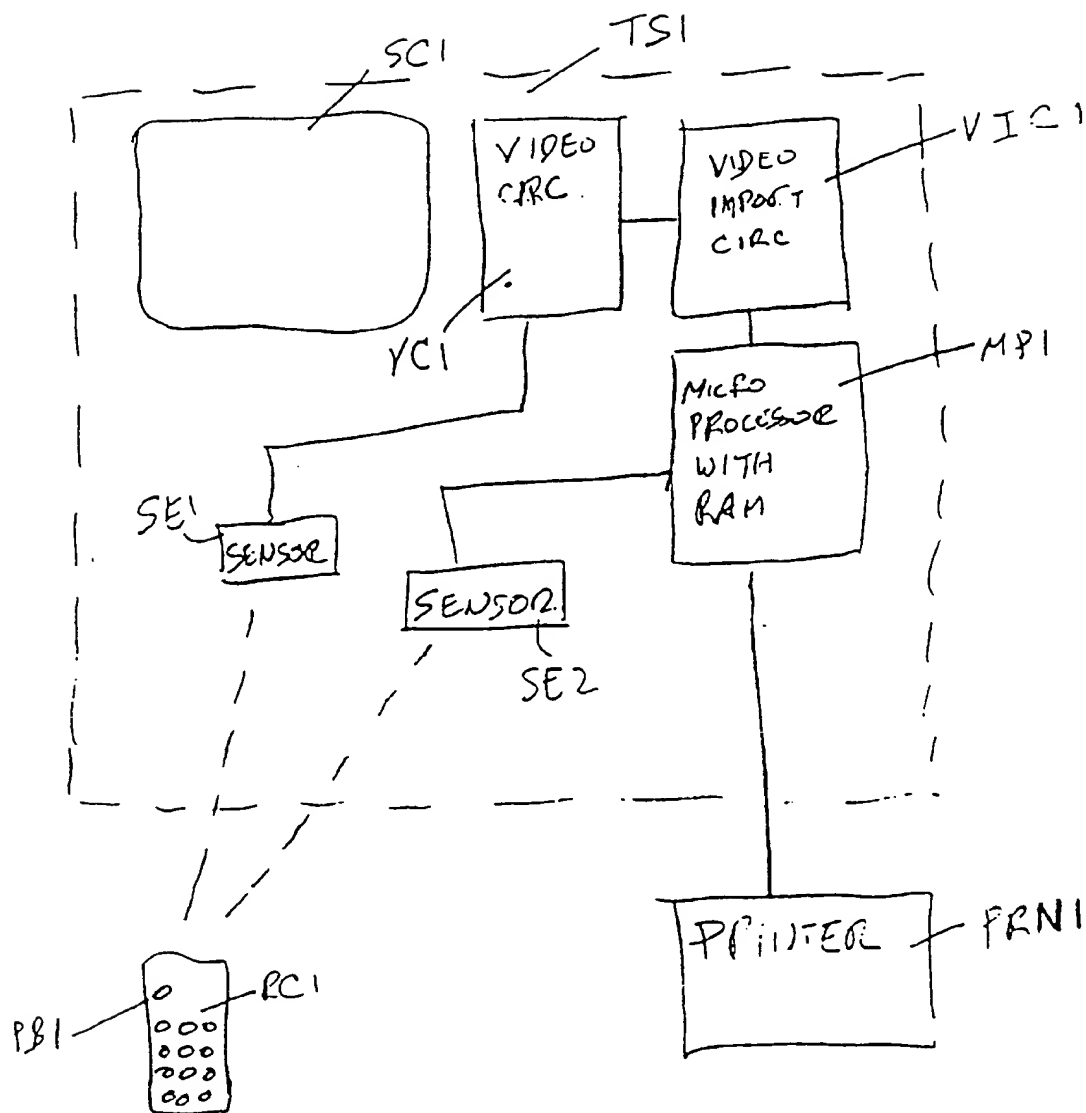


FIG. 3

FIG. 4

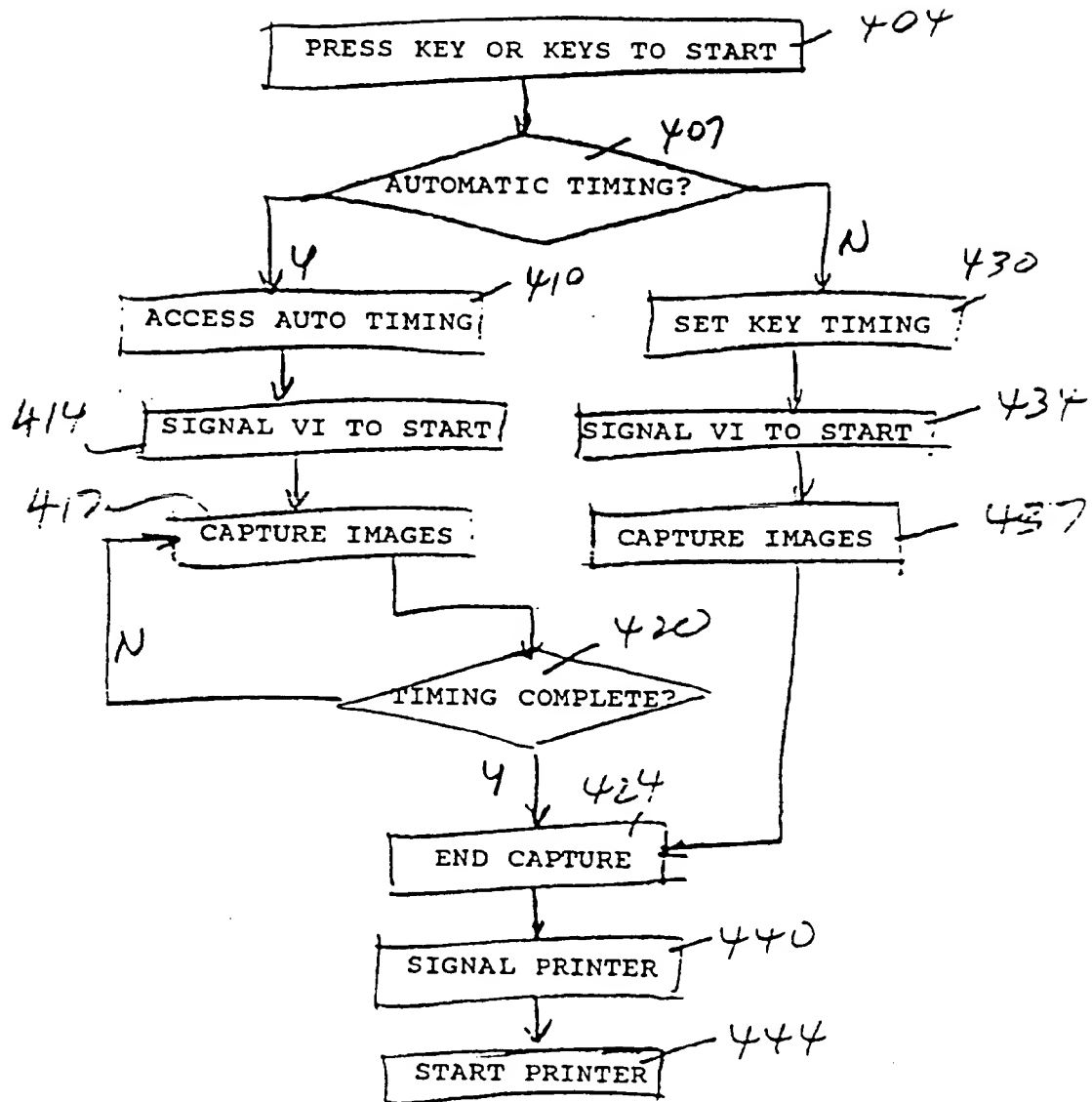


FIG. 5

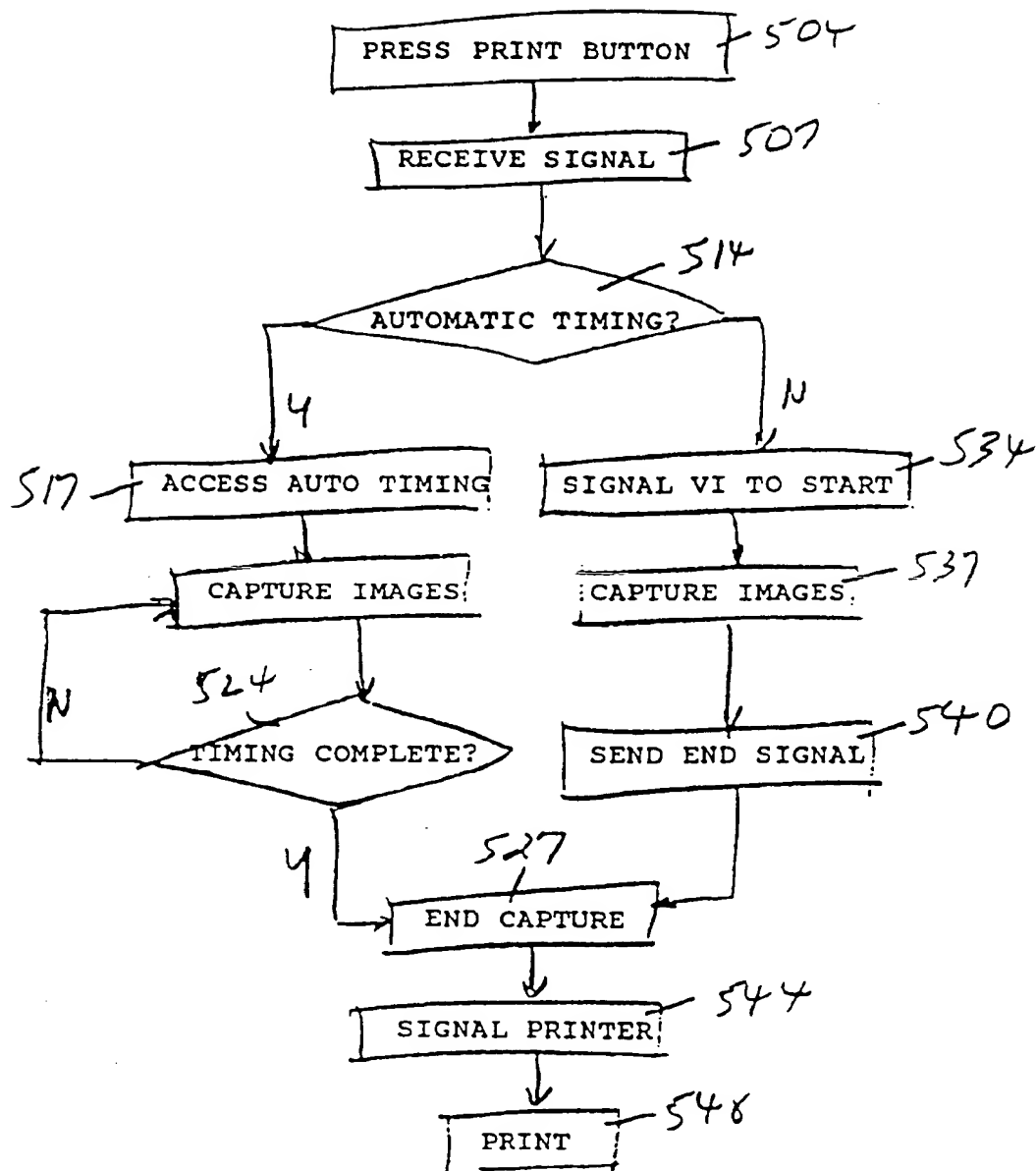


FIG. 6

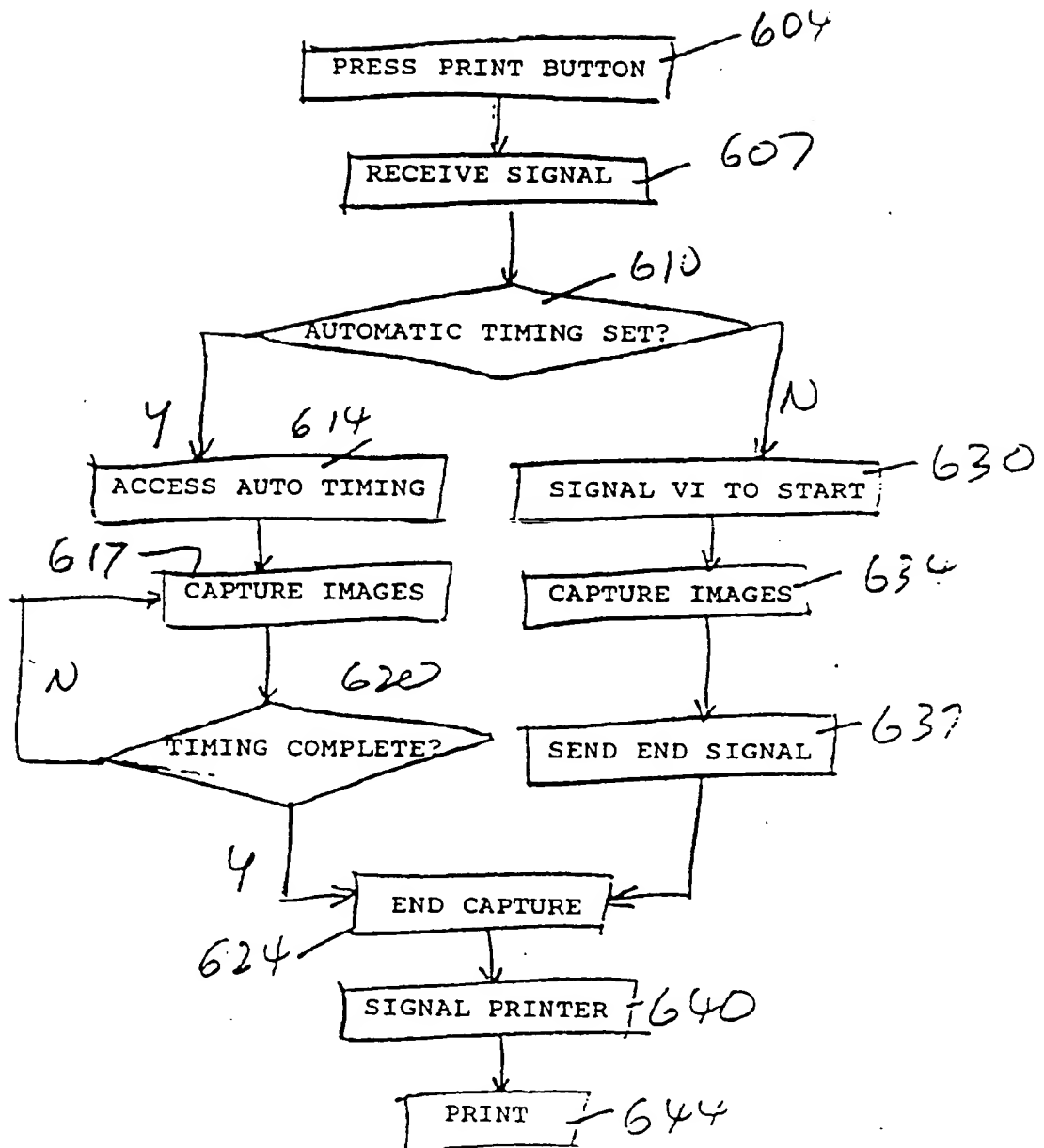
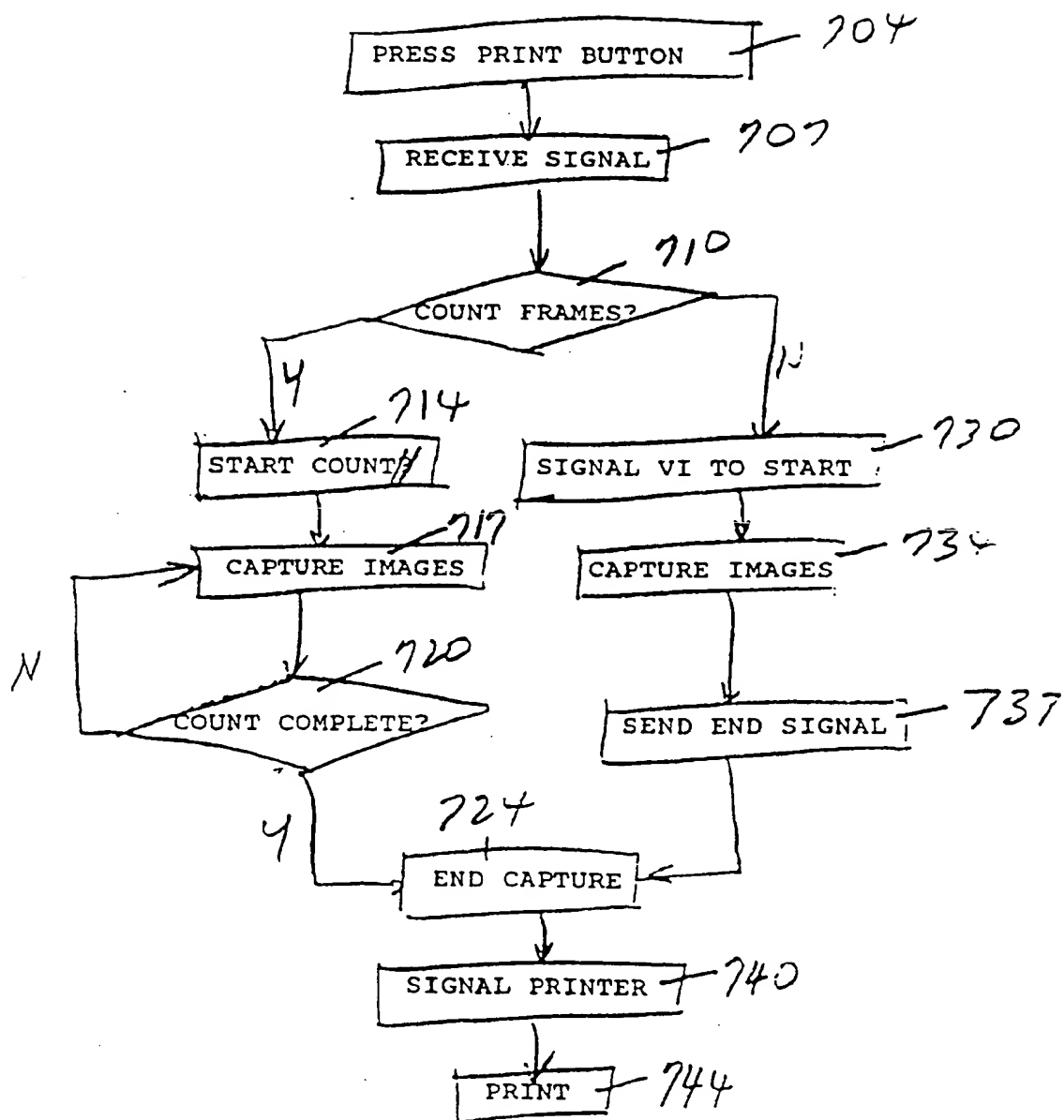


FIG. 7



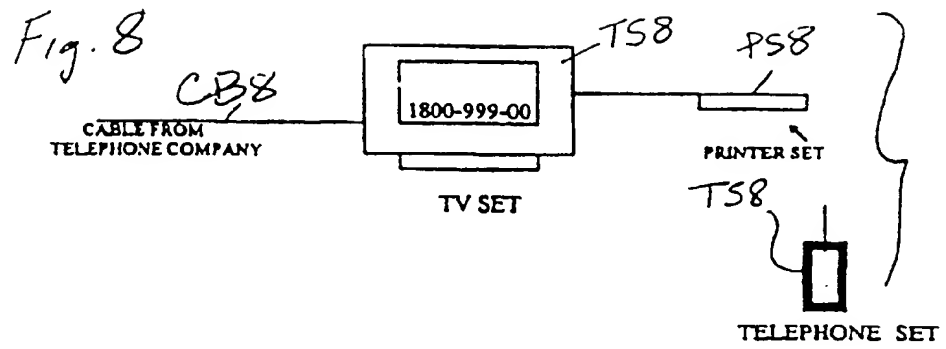


Fig. 9

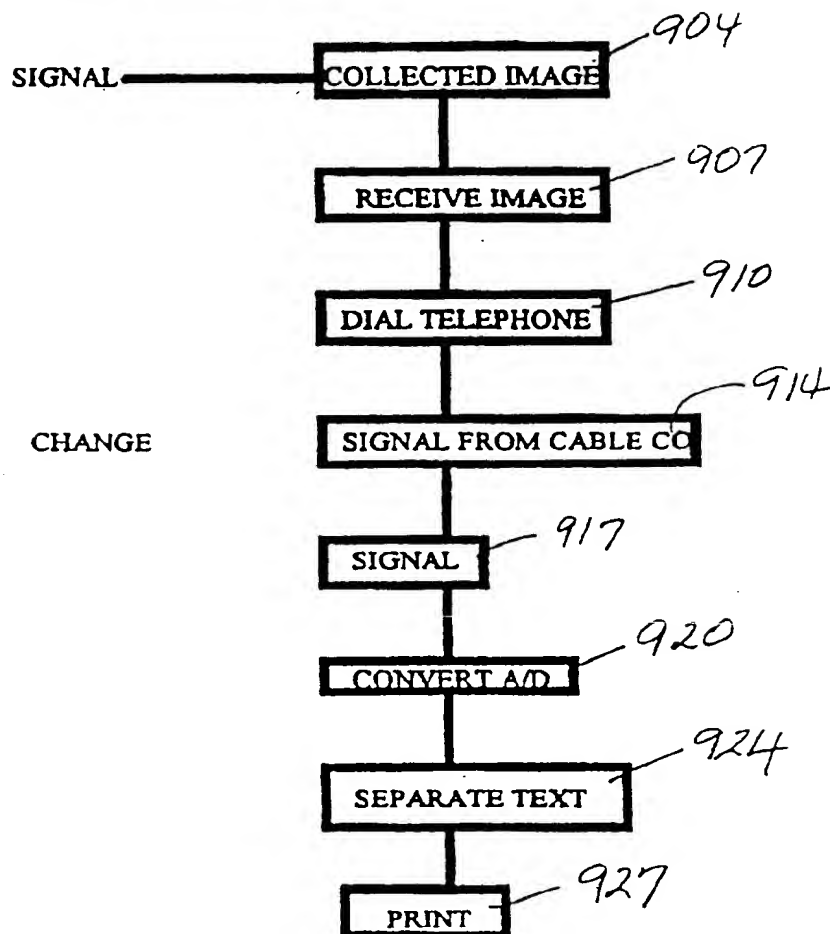
PROCESSING SITE

Fig. 10

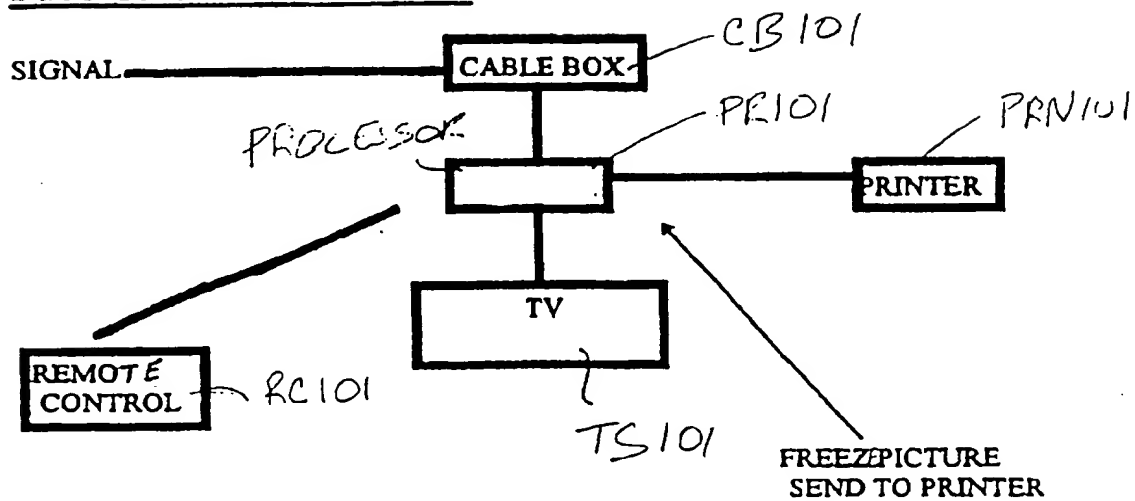
PROCESSING ON SIT.

Fig 11
PROCESSING ON SIT.

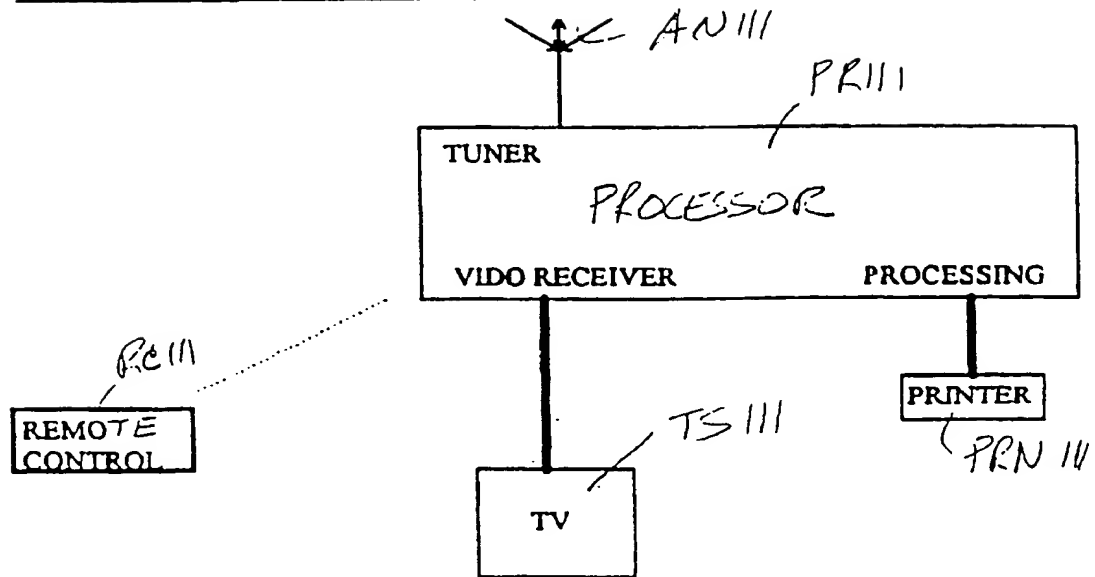


Fig. 12

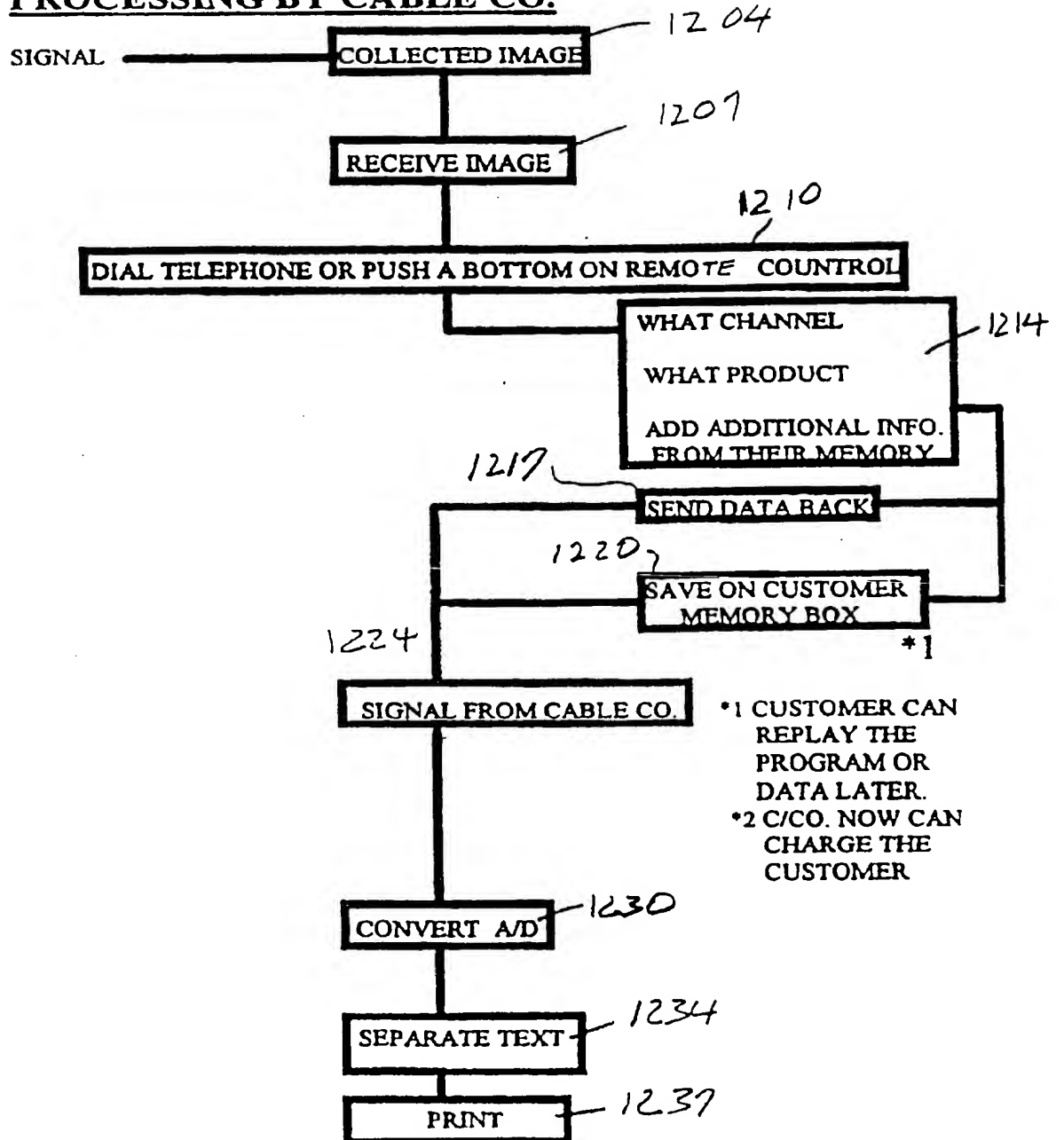
PROCESSING BY CABLE CO.

Fig. 13

